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Ethics and the Engineering Profession

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WHAT we are interested to know about any group, especially about a group which easily numbers 200,000 throughout the nation, is something as to its ideals. And thoroughly to understand that situation we must know the ideals of yesterday, as well as those of today, in order to see the drift and so to discern the probable ideals of tomorrow. The ethics or standards of conduct of any profession or group are very largely the reflection in action of its ideals. The moment ideals become fixed or static they are dead. This is the law of life. When we clothe a code of ethics as a guide to conduct with the quality of finality, it becomes as futile as sounding brass. Whether for the individual or the group it is in the light of our living, vibrant aspirations that all question of conduct must be tested. This is the constitution which rectifies the quibbles of language and the conflicts of interests.

Someone has said that an artist is one who holds ideals up before the people. If there is to be any significance in the term "profession" surely all professional men must qualify in this respect as artists. And engineers seem to be moving in this direction. One of the engineering societies, the American Society of Mechanical Engineers, was founded about forty years ago very largely on the ideal that there was a sufficient content in the science of mechanical engineering to warrant a national society devoted to its development. We have been told by the founders that among the majority of the charter members the view was strongly held that if all commercial con-

siderations were to be excluded the residue would not be sufficient to warrant the attention of a large national group. Of course, these doubts have long since been dissipated and today it seems like a platitude to say that the science connected with the mechanical arts is limitless in extent. This bit of history is cited here as affording a very concrete example of the way in which we progress through weaving into the fabric of the future materials which may not even be available today. The long look ahead—a point of view denied to those who are wholly engaged with present necessities—seems inherent in the equipment of the professional man.

About one hundred years ago when the British Institute of Engineers was founded, engineering was defined as "the art of directing the great sources of power in nature for the use and convenience of man." Perhaps it was all there, but who can fail to see the overwhelming growth in the conception of the possible function of the engineer as shown in Herbert Hoover's definition of engineering as "the profession of creation and construction, of stimulation of human effort and accomplishment." And must it not be assumed that with the fuller realization of this concept of the field of engineering action there will come corresponding changes in the accepted standards of professional conduct.

Perhaps the most fateful step taken within the profession since its inception is the inclusion in the constitution of the Federated American Engineering Societies of a clause which

reads, "This organization shall stand for the principle of publicity and open meetings" and the adoption in open convention of an interpreting by-law which reads, "The privilege of attendance at all meetings of the American Engineering Council, of the Executive Board, and of committees, when not in executive session, shall be extended to any proper person," and further, "Any proper person shall have the right to inspect and make true copies of the official records of all meetings of the Council, the Executive Board, and committees." To the credit of this organization it can be said that during 1921, its first year, it resorted to the executive session device but twice and then but for a few moments on each occasion. In the light of subsequent happenings at least one of these lapses was unnecessary and probably hindered rather than helped the work in hand.

Assuming that this radical departure in favor of publicity in engineering was made wittingly by these representatives of nearly 80,000 of the most representative American engineers and that it receives the understanding support of the rank and file and that in due course it is made a feature of the organization of all engineering bodies, then engineering becomes essentially a possession of the community, and this in a sense denied to other professions and even to government. It is usually assumed that the details of government, for instance, are open to public knowledge and inspection. But the necessities of party government, international relations and the relations between a public buyer and a private seller, frequently act as a more or less complete block to publicity. Obviously in law, medicine and the ministry, because of the paramount rights and privileges of the individual, there are frequent and uneradicable limitations

to publicity. But if the profession of engineering ever gets the vision as to the workability of complete publicity throughout its field, the change thereby effected in the life of the peoples and their governments will be far-reaching. The ethics of the profession will, I believe, frown more and more insistently on the use of engineering knowledge in secret ways and in secret places. Publicity in engineering neither challenges nor endangers any proper interest, public or private. The day will surely come when in a very real sense every engineer will be a public engineer.

Up to within a few years all engineering codes in this country were modelled after the code of the British Institution of Civil Engineers. The remarkable fact about this code and those which grew out of it was the failure to mention the public interest as a test—if not the supreme test of action. This omission has been very fully covered in the code adopted by the American Association of Engineers and published in the appendix to this volume.¹ A reasonably satisfactory recognition of the obligation is contained in the proposed Joint Code quoted in Mr. Christie's article.² The basic thought is adequately and eloquently expressed in the preamble to the constitution of the Federated American Engineering Societies as follows:

Engineering is the science of controlling the forces and of utilizing the materials of nature for the benefit of man, and the art of organizing and of directing human activities in connection therewith.

As service to others is the expression of the highest motive to which men respond and as duty to contribute to the public welfare demands the best efforts men can put forth, NOW, THEREFORE, the engineering and allied technical societies of the United States of America, through the

¹ See page 277.

² See pages 101-3.

formation of the Federated American Engineering Societies, realize a long cherished ideal,—a comprehensive organization dedicated to the service of the community, state, and nation.

The same idea is covered very completely in the last clause of the "Management Engineers' Creed," a terse code used by the Taylor Society, a society to promote the art and science of administration and management, which reads as follows:

The sublimest duty of the engineer is to keep the faith: The faith of the client that he will not undertake what he knows to be beyond his ability; and that with respect to what he undertakes he will give conscientious service to the limit of his ability;

The faith of his fellow engineers that he will remain true to his science and will magnify and not cheapen it; and that he will base his efforts for public recognition upon ability, scientific attainment and actual performance, and not upon ambiguous self-laudation;

The faith of the community that he will undertake no service inconsistent with the public welfare; and that in service consistent with public welfare, but in which the interests of groups appear to come in conflict, he will judge carefully and sympathetically the claims of rival interests, and attempt to establish that unity of purpose which promotes the public welfare.

The ultimate goal here is the flat-footed declaration that good engineering must be in the public interest and, contrariwise, that any engineering which is anti-social must be bad engineering.

These obsolete codes, such as those of the British Institution and that which now stands on the books of the American Society of Mechanical Engineers, were drafted under the conception that engineering was a craft and that those who practised it constituted a fraternity and as such owed a higher obligation to fellow-practitioners than to the public. In a code

adopted as recently as June, 1917, by the Western Society of Engineers occurs this sentence, "The ethical standards of the engineering profession should be those of a fraternity." In these earlier codes there was a strong reprobation against the use by engineers of anything but technical publications for making announcements of their discoveries, inventions, researches, etc. This had the tendency to make of engineering a cult rather than to advance the more obvious purpose, which was to discourage engineers from reaching the public prematurely. These weaknesses have been completely overcome in the more recent codes.

In the light of what has been said, the writer's apprehensions as to codes of ethics, interpretations of such codes and discipline under the codes will be clear. Just as laws are always interpreted in the light of the constitution, so ethical codes must always be interpreted in the light of the ideals of the profession. Hence it may easily become at any given time the highest function of the professional engineer to act and speak contrary to a code—or to all the codes—if by so doing the ideals of the profession may be conserved or advanced. Nowhere is the heresy of today more apt to be the honored standard of tomorrow than in the relatively unexplored field of engineering practice.

The greatest safeguard in the development of a proper procedure for the enforcement of ethical conduct is publicity. Possibly the present almost entire lack of publicity in these matters can be defended from the standpoint of the newness of our machinery and the liability to error growing therefrom. But absolute publicity must be the goal. The American Institute of Architects seems to set the pace in this respect.

In the long run it would probably

prove advantageous if we could declare, say a five-year period, in which absolutely no discipline or punishments would be meted out to offenders. This closed season would give everybody a chance to put his house in order if such revision be necessary. Five years is all too short a period in which to ascertain the mind of the profession through the investigation of complaints and the publication and discussion of interpretations. In the enforcement of ethical standards it must be the mind of the profession rather than that of a committee or a group which must be the authority. As the writer has said in another place:³

Ethical conduct for engineers is such as has received more or less general sanction. This means that conduct which at one time and place may receive very generous approval at another time or in a different locality may be generally considered reprehensible. So that the master test as to whether conduct is ethical or not depends largely on what people *generally*—and of course I mean well-intentioned people—think about it. That to have an individual or even a group agitate for certain reform has a value should go without saying. In fact, most improvements are brought about in this way. But these higher standards only become the rules for conduct when through education they have become *accepted* as proper by a sufficiently large or influential element within the given constituency. The point I want to make is that the writing out of a code or set of rules is useful only in establishing good conduct when such injunctions are so phrased as to be accepted as reasonable by those whose conduct they are intended to regulate. Neither the wisdom nor the exalted character displayed in the text is the test. The acceptance by the community is what makes the conduct ethical or not. In the same way our engineering practices are ethical or not as they conform to what may be called the best sense of the profession.

In the work of the Practice Committee of the American Association of Engineers my attention is constantly called to the difference between unethical conduct on the one hand and illegal and immoral conduct on the other. If the profession of engineering is to secure the confidence of the community in the degree necessary for the execution of a high task, it must erect standards such as will not only give the public no cause for suspicion but create in the public mind that absolute confidence which is the antithesis of suspicion. Think of the limitless freedom which the medical profession enjoys in the homes of the world. The wonder does not lie in the fact of this freedom. It lies rather in the fact that the members of the medical profession have carried themselves so faultlessly in these intimate relationships that we never pause to wonder at it.

Surely then we engineers can assume moral and legal conduct. Such conduct is inherent in every code. The man who offers a bribe or who requests one is guilty of an immoral act and usually of an illegal one. But it does not aid in the upbuilding of ethical professional standards to confuse such a breach of the moral sense of the community, or law-breaking of any kind, with those higher rules of conduct which are supposed to set off the professional man as a class entitled to the highest respect of the community.

The idea of leadership in the community seems to be inherent in the term "professional man." But leaders do not require the control of codes and procedures for their enforcement. Hence it is easy to read too much importance into such devices. They have an educational value for the young and also exert a deterring influence on those who do not want to play the game. Indeed, codes of ethics and the mechanisms through

³ *Professional Engineer*—November, 1920. Pp. 7-8.

which they are made effective may be likened to "trench cleaners" in modern warfare. Periodically the necessities of combat require that the trenches and the rear be freed of those who have not accepted the issue of battle. But the real line of advance—the shouting and the glory and the flag—are way out in front in No Man's Land and beyond.

It seems altogether possible that the engineer will play an increasingly important rôle in the immediate future. The Great War, with its lessons as to what can be accomplished through organization and the applications of science to the affairs of men, is still fresh in the minds of the peoples. There seems to be every incentive not only for the engineer to go forth to meet glorious opportunity but for the public to welcome him with open arms. But History is full of lost chances.

Given the excuse, a public in a surprisingly short time can grow lukewarm and even antagonistic. Civilization needs the "know how"—the constructive, creative mind—as never before.

The work ahead is one of producing world-wide effectiveness rather than individual or national profit, of cutting out waste rather than regimenting men. The engineer if he is to be equal to the task must approach it altogether from the service angle. To make us worthy and able for this task nothing will be of greater assistance than high standards of professional conduct—the higher the better. In fact the opportunity now knocking at our door will not be fully embraced until a deep spiritual relationship has been established between the engineer and a race set free.

The Ethics of the Mechanical Engineer

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IN the concept of his obligation to society, the mechanical engineer has always possessed an idealism, although it was not actually formulated until comparatively recent years. Whereas some of the organizations representing other branches of the engineering profession may have had codes of ethics, formally approved and recognized by their bodies at an earlier date than the first code of the American Society of Mechanical Engineers, it is inconceivable that with such founders as this Society possessed and with such engineers as have been included in its rolls of membership through practically the half century of its existence, the members of the Society have not taken on the ideals and motives of

these leaders as a guide for their professional conduct and in their relations to society. Men like Professor John E. Sweet, Alexander L. Holley, H. R. Worthington, Professor R. H. Thurston, its first president, all of whom were included among the founders of the Society, and men like Henry R. Towne and Captain Robert W. Hunt, fortunately still living, are all such recognized examples of practitioners of the highest ethical standards, that any organization fortunate enough to include their names within its membership must perforce adhere to high principles of ethical conduct or else such men would not continue as members. Such an organization must base all its transactions upon the